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10/553,604	06/23/2006	Timothy Merrick Long	00169.105188	7434

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EXAMINER	
NGUYEN, PHU K	
ART UNIT	PAPER NUMBER
2628	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/553,604	LONG ET AL.	
	Examiner	Art Unit	
	Phu K. Nguyen	2628	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 December 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6 and 10-15* is/are rejected.

7)☒ Claim(s) *7-9* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *9/13,28/07 & 1/31/08*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-6, 10-15 are rejected under 35 U.S.C. 102(e) as being anticipated by DYE et al. (6,518,965).

As per claim 1, Dye teaches the claimed "method of rendering a scan line of a graphic object image in a scan line renderer for spans of pixels lying between consecutive edges intersecting said scan line" (Dye, column 6, line 8), said method including the steps of "maintaining a set of depths present in the rendering of said scan line, said set being maintained in depth order" (Dye, column 34, lines 22-64), and "for each span, said set containing at least those depths that are active in said span and said set being subject to removal of at least one depth at a subsequent span on said scan line where the corresponding depth is no longer active" (Dye, column 20, lines 6-16; column 36, lines 7-21; for each span, only the depths of pixels of the triangle presented within that span is active, any triangle not presented with the scanning span is no longer active).

RESPONSE TO APPLICANT'S ARGUMENTS:

Applicant's arguments filed December 14, 2007 have been fully considered but they are not deemed to be persuasive.

Applicant argues that Dye does not teach "a scan line spans of pixels" which is not correct. Dye's scan line containing several triangle spans (column 16, lines 24-31) is clearly equivalent to Applicant's claimed "scan line spans of pixels." Furthermore, Dye's triangle spans (column 16, lines 40-49; column 18, lines 46-48) are equivalent to the claimed "spans of pixels" in which each triangle span is assigned depth information to be used in culling process. Therefore, Dye's scan line data has different triangle spans with their corresponding depth information in order to decide whether these triangles are visible from a view point.

Applicant argues that Dye does not teach "said set being subject to removal of at least one depth at a subsequent span on said scan line where the corresponding depth is no longer active." Dye's scan line contains several triangle spans with their corresponding depth information in order allowing the rendering of visible triangles (column 18, lines 49-55; column 20, lines 2-4). Dye's scan line then goes under another process of Z-rules determine for each scan line (Dye uses the scan line and the span line interchangeable, column 18, line 48) (column 20, lines 6-9). In this Z-rules determination, some set of pixels are subjected being removed due to a visibility rule (column 20, lines 15-16). Accordingly, Dye's Z-rules determination on the scan line is equivalent to the claimed "for each span, said set containing at least those depths that

are active in said span and said set being subject to removal of at least one depth at a subsequent span on said scan line where the corresponding depth is no longer active".

Applicant argues that Dye does not teach the feature of claim 2 "said set of depths is updated on a per-span basis" which is not correct. Dye's Z-rules performs on scanline-by-scanline basic (column 20, lines 5-6); herefore, the update of the depth on the scan line is must on "per-span basic" as claimed.

Claim 2 adds into claim 1 "said set of depths is updated on a per-span basis" (Dye, column 20, lines 5-6; column 26, lines 22-37).

Claim 3 adds into claim 1 "the set of depths is maintained using a content addressable memory" (Dye, trore the pixels data in a memory, step 308, figure 5B).

Claim 4 adds into claim 3 "said content addressable memory is addressed by at least depth, and references fill information related to graphic objects active in said span" (Dye, Z rule algorith, column 34, lines 22-42).

Claim 5 adds into claim 4 "said depth order of said set of depths is maintained using a map according to the steps of: associating said depths in said set of depths with a corresponding second depth indicating a relative ordering of depths on said span; using said map to map from each said second depth to each associated depth in said set of depths; reusing said set of depths and said map from span to span in increasing x

order; and maintaining an ordered state of said set of depths and said map during addition and removal of depths from said subset" (Dye, column 36, lines 22-60).

Claim 6 adds into claim 5 "when a depth is being added to the said set of depths, said maintaining comprises the steps of: marking each depth in said set of depths as being either above or below said added depth, thereby producing a set of marks; ordering said set of marks in the same order as that of said set of depths stored in said content addressable memory; reordering said set of marks in the order of their associated second depths as determined by said map; and reordering said map to reflect the new ordering of said depths as stored in the content addressable memory by their associated second depth, including said added depth, said reordering of said map uses said reordered set of marks" (Dye, column 36, line 38 to column 37, line 3).

Claim 10 adds into claim 1 "said rendering determines the raster data output for said span and wherein each depth is associated with a corresponding fill, said method further comprising the step of: using said set of depths and said fill associated with each depth in the said set of depths to produce a subset of fills wherein said depth order of said set of depths provides a depth ordering of said subset of fills" (Dye, column 44, lines 41-44; texture fill).

Claim 11 adds into claim 1 "said method provides input to a raster image

processor and said input is in the form of a tree of graphic objects, said tree being ordered by local depths, each said graphic object being associated with one or more fills, each fill in each said graphic object being associated with a local depth such that the local depth of fills are local to their graphic object and each graphic object is associated with a local depth, and wherein the local depth of each said graphic object is local to a corresponding parent graphic object, said method comprising the steps of: determining each of the depth associated with a corresponding said graphic object by traversing said tree of graphic objects in a depth first traversal of the tree; and traversing the fills associated with each said graphic object in local depth order; and assigning a sequential depth to fills as they are encountered in said traversal" (Dye, column 35, line 32 to column 37, line 3).

Claim 12 adds into claim 3 "said content addressable memory is formed in hardware" (Dye, column 8, lines 22-26).

Claim 13 adds into claim 3 "said content addressable memory is implemented by software" (Dye, the application software or the programmable CPU 102; column 8, lines 19-26).

Claim 14 claims a computer readable medium having a program to perform the method of claim1 (Dye, the memory 110); therefore, it is rejected under the same reason.

Claim 15 claims a computerized apparatus performing the method of claim 1 (Dye, column 8, lines 5-35); therefore, it is rejected under the same reason.

Claims 7-9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Claim 7 and its dependent claims 8-9 contains the allowable features: "partitioning said set of depths into those that potentially contribute to the raster data output of the current span and those depths that presently do not, said set of depths being maintained in said depth order, where said depth ordering is separately imposed on said contributing partition and said non-contributing partition, said method comprising: forming a combined index for each said depth in said span, each said combined index having a most significant part that indicates a corresponding one of said partitions and a least significant part indicating said separately imposed depth ordering; ordering of said combined indices to provide said partitioning and said depth ordering, said ordering of said combined indices being achieved by means of a map; associating said combined index of each said depth in said set of depths with a corresponding further depth, said further depth indicating both said partitioning by

contribution and the relative ordering of depths in each partition on said span; mapping, using said map from each said further depth to said associated combined index of each depth in said set of depths; and reusing said set of depths and said map from said span to span in increasing x order; wherein said set of depths and said map maintaining an ordered state during addition and removal changes in contribution status of a depth in said set of depths."

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phu K. Nguyen whose telephone number is (571) 272 7645. The examiner can normally be reached on M-F 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Razavi can be reached on (571) 272 7664. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Phu K. Nguyen/
Primary Examiner, Art Unit 2628